

# SEASONAL VARIATIONS IN HAEMATOLOGICAL INDICES IN THE GREY-BREADED GUINEA FOWL (*Numida Meleagris Galeata Pallas*)

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## ABSTRACT

The influence of seasons on the haematological indices were studied in the grey breasted guinea fowl (*Numida meleagris galeata pallas*) in the arid zone on Borno State. Blood samples for haematological analysis were collected from the wing vein of the birds. The RBC counts and PCV values were significantly ( $P < 0.05$ ) increased during the hot weather period compared to the values obtained in the cold period. This increase may be due to decreased plasma volume resulting from increase in body water loss at high ambient temperatures

## INTRODUCTION

Poultry industry is one of the important sources of protein in Nigeria. Currently dominating this industry is the domestic fowl (*Gallus domesticus*), especially the exotic breeds, although, the guinea fowl have been making an appreciable impact in this sector. Several investigations on the biology of this bird (Immelman, 1972; Olowookorun *et al*, 1980; Onuora, 1982) have been carried out with a view to improving it. Ayeni and Ayanda (1982) has shown from a nation wide survey that the guinea fowl meat is widely accepted and preferred to that of the domestic fowl by a large number of Nigerians because of its very palatable taste.

Haematological evaluation is a valuable aid in the diagnosis of many diseases in animals; in determining the extent of damage to blood cells and in evaluating the responses of the animal to therapy (Woerpel and Rosskopf, 1984). Therefore, the need to have haematologic reference values of animal species in any particular climatic zone can not be overemphasized. With this in mind the haematological parameters in the grey-breasted guinea fowl were determined in both

the cold and hot weather conditions that predominate in Maiduguri. This is necessary if increased guinea fowl production is to be achieved which will solve the problems of decreased protein intake in our food since it is cheaper than domesticated fowl.

## MATERIALS AND METHODS

Twelve guinea fowls of both sexes, aged 6-8 months, and weighing between 1.4 to 2kg, were used for the study. The animals were purchased from the Maiduguri Monday Market. The animals on arrival were dewormed with fenbendazole (Panacur<sup>(R)</sup>, Hoechst AG, Frankfurt, Germany) at an oral dose of 50mg per kg body weight. The animals were kept in a poultry house (battery system) at the Faculty of Veterinary Medicine, University of Maiduguri, Maiduguri. Commercial poultry feed (grower's mash) and water were fed *ad libitum*.

Prior to the commencement of the experiment, each bird was physically examined to make sure they are clinically healthy and screened for the presence of coccidia organisms. The study was divided into two phases, the cold and hot seasons. The same animals were used for the two phases of study. During each phase of study a blood sample was taken from each guinea fowl from the wing vein using disodium ethylenediaminetetraacetate (EDTA) as anticoagulant. Blood sample analyses were done on the day of collection. The erythrocyte count (RBC), haematocrit (PCV) and haemoglobin (HB) determinations were carried out using the method of Brown (1976). The mean corpuscular volume (MCV) and mean corpuscular haemoglobin (MCH) were calculated from standard formulae (Schalm *et al.*, 1975).

The results were expressed as mean  $\pm$  S.D. Tests for significance difference between the paired means in respect of hot and cold periods were performed, using the Student's "t" test (Snedecor, 1956).

## RESULTS

The results of the haematological indices in apparently healthy guinea fowls in the hot and cold seasons are shown in Table 1. The mean values of the RBC counts and the percentage PCV in

TABLE 1. HAEMOGRAM (MEAN  $\pm$  STANDARD DEVIATION) OF GUINEA FOWLS (MIXED SEXES) AS INFLUENCED BY DIFFERENT SEASONS

Parameters	Hot Season (n = 12)	Cold season (n = 12)	P
Hb Conc (g/dl)	11.70 $\pm$ 0.73	10.71 $\pm$ 0.57	> 0.05*
RBC ( $\times 10^6$ /ul)	3.78 $\pm$ 0.42	2.67 $\pm$ 0.40	< 0.05
PCV (%)	38.2 $\pm$ 3.68	28.5 $\pm$ 5.05	< 0.05
MCV (fl)	101.44 $\pm$ 5.83	105.98 $\pm$ 4.11	> 0.05*
MCHC (g/dl)	30.82 $\pm$ 1.29	38.62 $\pm$ 4.66	< 0.05
MCH (Pg)	30.61 $\pm$ 1.50	41.22 $\pm$ 3.43	< 0.05

P, Statistical level of significance as determined by student's t-test

\* not statistically significant.

the hot season differed significantly ( $P < 0.05$ ) from those obtained in the cold season. There was no significant ( $P > 0.05$ ) difference in the mean HB concentrations between the hot and cold seasons.

Of the haematologic indices, the mean corpuscular haemoglobin concentration (MCHC) and MCH were significantly ( $P < 0.05$ ) influenced by the different seasons, while there was no significant ( $P > 0.05$ ) difference in the MCV values between the hot and cold seasons.

## DISCUSSION

The result of the present study shows that the grey breasted guinea fowls may be susceptible to

marked fluctuations of red blood cell counts caused by changes in the environmental temperature. The observed significant increase in the cell count and the PCV during the hot season as compared with the cold might be due to decrease in plasma volume, that resulted from increase in body water loss at high ambient temperatures. In an earlier study in domestic fowls, Moye *et al.* (1970), observed that the effect of temperature on haematological values was due to both increased erythrocyte production and mean cell volume.

The increase in erythrocyte counts and PCV values in the hot weather periods in the guinea fowls seem to agree with the observations of Simensen and Olson (1980), who noticed increased erythrocyte and haematocrit values due to upper lethal environmental temperature in turkeys. However, these observations are at variance with those of other workers (Huston, 1965; Washburn and Huston, 1968; Moye *et al.* 1970; Deaton *et al.* 1970; Soliman and Huston, 1972; Anosa and Isoun, 1978) who reported increased erythrocyte and haematocrit values in other species with decreased environmental temperatures.

It is also possible that the haematological values of the hot weather period reflects more the normal values, the guinea fowls being indigenous to the semi-arid zone region, compared with values obtained in the cold weather period.

It is concluded therefore, in the present study that the haematological values of the grey breasted guinea fowl may be affected by temperature changes due to seasonal variations.

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